

Army Regulation 5-11

Management

Management of Army Models and Simulations

**Headquarters
Department of the Army
Washington, DC
10 July 1997**

UNCLASSIFIED

SUMMARY OF CHANGE

AR 5-11

Management of Army Models and Simulations

This revision --

- Lists responsibilities of Army Senior Management for Models and Simulations (M&S)(para 1-5)
- Designates the Army Model and Simulation Office (AMSO) as the Army Central Management Office for M&S (para 2-1)
- Provides new elements of M&S management (para 2-2)
- Designates the Deputy Under Secretary of the Army for Operations Research (DUSA(OR)) as M&S policy proponent within the Army (para 2-3)
- Designates the Deputy Chief of Staff for Operations (DCSOPS) as the planning and prioritization proponent within the Army (Para 2-5.a)
- Designates the AMSO Technical Advisor to coordinate the Army's Model and Simulation Technology Review (para 2-5.b)
- Designates the Army Model and Simulation (AMS) General Officers Steering Committee (GOSC) as final adjudicator of M&S issues (para 2-6)
- Reorganizes the role of the Army Model and Simulation Council (AMSEC) and the supporting working groups
- Reconfigures management of the Army Model Improvement Program (AMIP) (para 3-2)
- Provides new responsibilities and more detailed duties to the Army Model and Simulation Office (AMSO) (para 2-8)
- Introduces the role of Domain Managers in the execution of M&S management (para 2-9)
- Prescribes new goals of the Army Model and Simulation Management Program (AMSMP) (para 3-2)
- Describes the roles of the Army Model Improvement Program (AMIP) and the Simulation Technology (SIMTECH) Program in the AMSMP Program (para 3-2)
- Provides policy changes for M&S program planning (para 3-3)
- Provides policy changes for M&S program management (para 3-4)
- Delineates status reporting through "The Army Model and Simulation Standardization Report" (para 3-5)
- Describes funding policy for AMIP and SIMTECH programs (para 3-6.b)
- Prescribes role of Domain Managers in requirements determination (para 4-3)
- References DoD interoperability policy, architecture, and framework (para 4-4)
- Prescribes cataloguing of Army M&S (para 4-7)
- Describes Legacy M&S (para 5-1.c)
- Describes new Verification & Validation (V&V) requirements for certain M&S (para 5-1.d)
- States that Army is final authority for validation of representations of its own assets (para 501.I)
- Describes interaction between Army and DoD M&S policies (para 5-3.j)
- Delineates role of TRADOC Analysis Center (TRAC) as Army V&V process proponent for Distributed Interactive Simulation (DIS) (para 5-4)
- Provides expanded detail on documentation of the V&V process (para 5-4)
- Prescribes conditions under which reaccreditation is required (para 5-5)
- Prescribes provision of M&S resources for VV&A in acquisition strategies (para 5-6)
- Provides a role for commercial standards in configuration management (6-2)
- Provides for use of DoDD 8320 Series in management of M&S (para 7-2)

- Provides information on role of the Defense Data Repository System (DDRS) and DoDD 8320.1-M in data management. Describes role of AMSO in this process (para 7-3c)
- Provides revised procedures for Foreign Military Sales (FMS) (para 8-8)
- Provides revised procedures for transfer of M&S to foreign governments through other than FMS (para 8-9)

Effective 10 August 1997

Management

Management of Army Models and Simulations

ORIGINAL SIGNED

Togo D. West, Jr.
Secretary of the Army

History.

This edition publishes a revision of this publication. Because the publication has been extensively revised, the changed portions have not been highlighted.

Summary. This regulation has been extensively revised to describe the expanded organizational roles in the management of Army. It takes into account emerging DoD initiatives concerning the management of M&S. It prescribes policies and responsibilities for the management of M&S used for all purposes within the Army. It also provides a management structure and

serves as an index to other DoD and Army regulatory guidance governing the development, acquisition and use of M&S. The regulation introduces the Army Model and Simulation General Officer Steering Committee (AMS GOSC) and the Army Model and Simulation Office (AMSO).

Applicability. This regulation applies to the Active Army, the Army National Guard, and the U.S. Army Reserve. It applies to all computer-based M&S.

Proponent and exception authority. The proponent of this regulation is the Deputy Under Secretary of the Army for Operations Research (DUSA(OR)). The proponent has the authority to approve exceptions to this regulation consistent with controlling law and regulation. Proponent may delegate this approval authority in writing to a division chief within the proponent agency in the grade of Colonel or the civilian equivalent.

Army management control process. This regulation contains management control provisions, but does not identify key management controls that must be evaluated. This regulation contains management control provisions but does not contain checklist for conducting management control reviews and to accomplish assessment of

management.

Supplementation. Supplementation of this regulation and establishment of command and local forms are prohibited without prior approval from DUSA(OR), 102 Army Pentagon, ATTN: SAUS-OR, Washington, DC 20310-0102.

Interim changes. Interim changes to this regulation are not official unless they are authenticated by the Administrative Assistant to the Secretary of the Army. Users will destroy interim changes on their expiration dates unless sooner superseded or rescinded.

Suggested improvements. Users of this regulation are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to U.S. ARMY MODEL AND SIMULATION OFFICE (AMSO), ATTN: DAMO-ZS, 400 ARMY PENTAGON (ROOM 1E543), WASHINGTON, DC 20310-0450.

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Chapter 1

Introduction

1-1. Purpose

This regulation prescribes policy and guidance and assigns responsibilities for the management of Army Models and Simulations (M&S).

1-2. References

Required and related publications and prescribed and referenced forms are listed at appendix A.

1-3. Explanation of abbreviations and terms

Explanation of abbreviations and special terms used in this regulation are in the glossary. The abbreviation "M&S" throughout this regulation is used to represent model, simulation, simulator, or model and simulation. Activities governed by this regulation are the development and maintenance of computer based models and simulations, as defined in the glossary.

1-4. Responsibilities

a. The Vice Chief of Staff, Army (VCSA) and the Army Acquisition Executive (AAE) will co-chair the AMS GOSC (see paragraph 2-6).

b. The Assistant Secretary of the Army for Research, Development and Acquisition (ASA(RDA)) will--

(1) Direct Army-wide research, development and acquisition in support of M&S.

(2) Lead Army participation in development of the OSD Technology Area Plan and Technology Area Review for M&S.

c. The Deputy Under Secretary of the Army for Operations Research (DUSA(OR)) will--

(1) Serve as Headquarters, Department of the Army (HQDA) proponent for M&S policy and standards.

(a) Establish and manage technical and procedural standards to guide the development and use of Army M&S.

(b) Provide policy guidance for the life cycle management, resourcing, verification, validation, accreditation, configuration management, interoperability, and release of all M&S.

(2) Co-chair the Army Model and Simulation Executive Council (AMSEC) (see paragraph 2-5).

(3) Serve as the Army's representative to the DoD Executive Council for Models and Simulations (EXCIMS).

(4) Provide HQDA staff guidance for the execution of the Army Model and Simulation Management Program (AMSMP) (see Chapter 4) to include policy formulation, programs, plans, goals, architectures, standards, structure and resources.

(5) Ensure that all aspects of the AMSMP are integrated with respect to the requirements of individual functional disciplines and the Army Enterprise Architecture (AEA).

(6) Act as the Army proponent for information repositories pertaining to Army M&S.

(7) Serve as a member of the Army Major Automated Information Systems Review Council (MAISRC) for systems involving the use of M&S.

d. The Deputy Chief of Staff for Operations and Plans (DCSOPS) will--

(1) Serve as HQDA proponent for M&S planning, prioritization, and programming.

(2) Co-chair the AMSEC.

(3) Fully integrate, prioritize and oversee M&S requirements (as approved by the Commanding General, Training and Doctrine Command (CG, TRADOC)) and applications throughout the Army.

(4) Establish and supervise the U.S. AMSO.

e. The Director of Information Systems for Command, Control, Communications, and Computers (DISC4), as the Chief Information Officer for the Army, will allow unique policy guidance for M&S within the AEA, if necessary.

f. Principal HQDA and Secretariat officials, including those listed above, Major Army Command (MACOM) commanders, directors, and agency heads within the Army will--

(1) Serve as proponents for individual M&S applications within their areas of responsibility.

(2) Implement and monitor M&S activities for field operating agencies, staff support agencies, and any other activities under their purview.

g. Commanding General (CG), U.S. Army Training and Doctrine Command (TRADOC) reviews and approves Army M&S requirements.

1-5. Management of Army Models and Simulations - Overview

a. This regulation is designed to provide guidance to supplement other existing regulations which govern the design, development, application, and disposition of software and dedicated hardware, including M&S. This supplementary guidance addresses the unique characteristics of M&S that distinguish them from other computer software applications. The management requirements in this regulation apply to all agencies involved in the development, execution, management, or maintenance of Army M&S.

b. The Army's philosophy is that M&S, to include Simulators, are not an end unto themselves, but a critical set of closely related tools which contribute to the accomplishment of Army missions. No single authority exists to centrally manage all applications of these tools. What is described in this regulation is the management structure which exists, to include roles in corporate management of M&S.

Chapter 2

Concept and Execution of M&S Management in the Army

2-1. General

The Army Model and Simulation Office (AMSO) is the Army central management office for Army M&S. AMSO's mission is to provide the vision, strategy, oversight, and management of M&S, across all M&S domains. Headquarters Department of the Army (HQDA) M&S management concept is comprised of four key elements. Those elements are listed in paragraph 2-2 with a short description. Due to the varied nature and wide dispersion of M&S applications throughout the Army, no one authority can exercise control over all aspects of M&S management. What is described in the following paragraphs is a coordinated effort distributed among the several major officials primarily responsible.

2-2. Elements of M&S management

a. *Develop policy.* Army policies on development and usage of M&S are principally derived from DoD Directive 5000.59 and are reflected in chapters 3 through 8 of this regulation.

b. *Establish standards.* Establishment of technical and procedural standards to guide the development and use of Army M&S is an important element of the *Army M&S Master Plan* (see paragraph 3-3) and is supported through funding by the Army Model Improvement Program (AMIP) (see paragraph 3-2a).

c. *Prioritize and integrate requirements and investments.* This function includes providing a HQDA statement of strategic direction for Army M&S; prioritizing and integrating M&S requirements; and maintaining visibility of M&S activities throughout the Army by use of M&S Domain Managers. Establishing budget and program priorities for those activities is a central output.

d. *Direct research and technology.* The Army Science and Technology (S&T) Master Plan directs varied efforts generating research into M&S technology. These efforts feed development of the DoD Technology Area Plans. Application of emerging technologies to Army M&S is partially funded by the Simulation Technology (SIMTECH) Program (see paragraph 3-2b) which is complementary to the Army's S&T Program.

2-3. Propensity for elements of M&S management

a. *Policy and standards propensity.* The DUSA(OR) is the designated policy proponent for M&S within the Army. Under this authority, the DUSA(OR) exercises control over M&S Policy and M&S Standards (see paragraph 2-2a and 2-2b). The DUSA(OR) domain executive agent in this role is the AMSO.

b. *Requirements determination, integration, and prioritization propensity.*

(1) The CG, TRADOC, approves Army M&S requirements. He is advised by the Requirements Integration Council (RIC), which reviews the requirements from the M&S domains for duplications and ensures infrastructure (cross-domain) requirements are integrated.

(2) The DCSOPS is the designated planning, prioritization, and programming proponent for M&S within the Army. Under this authority, the DCSOPS exercises control over M&S Planning and Prioritization (see paragraph 2-2c). The DCSOPS executive agent in this role is the AMSO.

c. *Research and technology propensity.*

(1) The Assistant Secretary of the Army for Research, Development and Acquisition (ASA(RDA)) is the designated proponent for research and technology within the Army. Under this authority the ASA(RDA) executes control over Science and Technology programs to include research to advance M&S technologies (see paragraph 2-2d). The ASA(RDA)'s agent in this role is the Deputy Assistant Secretary for Research and Technology (DAS (R&T)). The DAS (R&T) provides guidance and oversight to the Army S&T Program through the annual publication of the Army Science and Technology Master Plan, which provides visibility and emphasis to M&S Research and Technology.

(2) The AMSO Technical Advisor will coordinate across the Army to guide research into M&S technologies and publish this guidance and information on ongoing efforts in the annual Army Model and Simulation Technology Review.

2-4. Army Model and Simulation General Officer Steering Committee (AMS GOSC)

The AMS GOSC will provide the Army M&S vision and act as final adjudicator of AMSEC M&S issues and as the approval authority for the Army Model and Simulation Master Plan and the Army M&S Investment Plan. It shall--

a. Be chartered in coordination with the Office of the Administrative Assistant to the Secretary of the Army.

b. Be co-chaired by the VCSA and the AAE.

c. Consist of the following membership--

(1) DUSA(OR).

(2) DAS (R&T).

(3) DISC4.

(4) DCSOPS.

(5) Deputy Chief of Staff for Intelligence (DCSINT).

(6) Deputy CG, TRADOC (DCG, TRADOC).

d. Meet at the call of the co-chairs only to resolve major issues of Army M&S management.

2-5. Army Model and Simulation Executive Council (AMSEC)

The AMSEC is the principal council which adjudicates issues governing all M&S activities in the Army. It makes recommendations regarding the Army position on M&S issues to the co-chairs. The AMSEC shall--

a. Be chartered in coordination with the Office of the Administrative Assistant to the Secretary of the Army.

b. Be co-chaired by DCSOPS and DUSA(OR).

c. Meet at the call of the co-chairs.

d. Consist of representatives in the rank of Colonel or above (or civilian equivalent) from the--

(1) Office of ASA(RDA).

(2) Office of Assistant Secretary of the Army for Financial Management and Comptroller (ASA(FM&C)).

(3) Office of Assistant Secretary of the Army (Manpower and Reserve Affairs) (ASA(M&RA)).

(4) Office of the DISC4.

(5) Office of the Deputy Chief of Staff for Personnel (DCSPER).

(6) Office of the DCSINT.

(7) Office of the Deputy Chief of Staff for Logistics (DCSLOG).

(8) Office of the Chief, Army Reserve (OCAR).

(9) National Guard Bureau (NGB).

(10) Program Analysis and Evaluation Directorate (PAED).

(11) US Army Digitization Office (ADO).

(12) US Army Concepts Analysis Agency (USACAA).

(13) US Army Research Institute for Behavioral and Social Sciences (ARI).

(14) US Army War College (AWC).

(15) US Army Corps of Engineers (USACE).

(16) US Army Forces Command (FORSCOM).

(17) US Army Training and Doctrine Command (TRADOC).

(18) US Army Materiel Command (AMC).

(19) US Army, Pacific (USARPAC).

(20) US Army, Europe (USAREUR).

(21) US Army, South (USARSO).

(22) US Army Special Operations Command (USASOC).

(23) US Army Operational Test and Evaluation Command (OPTEC).

(24) US Army Space and Missile Defense Command (SMDC).

(25) Military Transportation Management Command Transportation Engineering Agency (MTMCTEA).

(26) US Army Model and Simulation Office (AMSO).

(27) Office of each Domain Manager and Domain Agent.

(28) Distributed Interactive Simulation (DIS) Functional and Technical Managers.

e. Invite representatives of other organizations to participate as observers at AMSEC meetings at the discretion of the Co-chairs.

f. Recommend planning and prioritization guidance to the DCSOPS concerning the requirements, management and use of M&S in the Army.

g. Recommend strategic policy guidance to the DUSA(OR) concerning the management of all Army M&S.

h. Recommend program direction to the DUSA(OR) concerning the development of standards for all Army M&S.

i. Review the Army M&S Master Plan and the Army M&S Investment Plan and recommend approval to the AMS GOSC.

j. Have subcommittees as appointed by the co-chairs, to include at a minimum--

(1) Advanced Simulation Working Group. Manages cross-domain, leading programs (e.g. Synthetic Theater of War (STOW)), reviews and coordinates funding for advanced simulation requirements.

(2) Requirements Integration Working Group (RIWG). Serves as a forum to review domain requirements, integrate requirements across domains, investigate opportunities for leveraging, and eliminate duplication. The RIWG is co-chaired by AMSO and TRADOC. Domain managers submit requirements to the RIWG. The RIWG reviews inputs and integrates requirements across domains. The RIWG forwards M&S requirements recommendations to the CG TRADOC (advised by the RIC) for approval.

(3) Army Model and Simulation Management Program (AMSMP) Working Group. Deals with the ongoing activities regarding standards and policies for M&S.

k. Review M&S activities for inclusion in the AMIP and the SIMTECH Programs.

l. Review changes in the scope of overall management of Army M&S.

2-6. The Army Model and Simulation Office (AMSO)

The AMSO will perform the following functions--

a. Act as focal point for Army M&S matters in dealing with the Joint Staff, Commanders-in-Chief (CINCs) of the Unified Com-

- mands, the Defense Advanced Research Projects Agency (DARPA), the Defense Modeling and Simulation Office (DMSO), as well as other Services, Defense Agencies, and OSD staff elements.
- b. Coordinate issues and actions for the AMSEC and AMS GOSC meetings.
 - c. Advocate "Educate the Total Force" on M&S related activities.
 - d. Promulgate Army M&S policy approved by the DUSA(OR).
 - e. Sponsor development of Army M&S standards as directed by the DUSA(OR) and publish the Army Model and Simulation Standards Report.
 - f. Publish the biennial Army Model and Simulation Master Plan. The Master Plan--
 - (1) Serves as a two-year planning guide.
 - (2) Establishes the Army's M&S Vision and the supporting technical standards development process managed by AMSO.
 - (3) Details specific Army M&S objectives based on the DoD M&S Master Plan, DoD 5000.59-P.
 - (4) Provides format and time lines for submitting annual Standards Category Coordinator (SCC) reports with AMIP project nominations and SIMTECH Program project nominations.
 - (5) Provides implementation of the M&S Vision by preparing an Army M&S investment strategy that supports approved requirements.
 - g. Publish the Army Model and Simulation Investment Plan as an annex to the Army Model and Simulation Master Plan to--
 - (1) Support approved requirements. Prior to investment of resources for development of new M&S or significant enhancements to existing M&S, requirements must be submitted through appropriate domain management for approval, integration, and prioritization (see paragraph 2-7).
 - (2) Coordinate and consolidate M&S investment priorities across all domains for input to the separate Program Evaluation Groups (PEGs).
 - (3) Justify and defend M&S programs in the Program Objective Memorandum (POM) consistent with the Army Model and Simulation Master Plan and approved requirements.
 - (a) Monitor PEG and POM actions in order to help synchronize efficient allocation of resources and serve as HQDA functional proponent for M&S program and budget formulation, justification, and defense, to include functional proponent input to M&S related Program Budget Decision (PBD) actions.
 - h. Publish the Army Model Model Improvement Program (AMIP) and Simulation Technology (SIMTECH) Program Stewardship Report.
 - i. Coordinate research into M&S techniques and publish the Army Model and Simulation Technology Review.
 - j. Coordinate and recommend to DUSA(OR) the approval or denial of requests for release of Army M&S to foreign governments.
 - k. Establish and maintain the Army node of the Models & Simulation Resource Repository (MSRR), as the official Army repository of M&S information, including specific information regarding Verification, Validation and Accreditation (VV&A) activities.
 - l. Prepare M&S campaign plans for advanced simulations, as required.
 - m. Chair the permanent AMSEC working groups-- Advanced Simulations; Requirements Integration; and Army Model and Simulation Management Program.
 - n. Manage the execution of the AMIP and SIMTECH programs for the DUSA(OR).

2-7. Domain Managers and Agents

Management of Army M&S is executed through domains of mission activity in which these tools are used. These domains follow functional, not organizational, lines in areas specified by the Army

Model and Simulation Master Plan and illustrated in Table 2-1 below.

- a. A manager for each domain is designated at HQDA in the Master Plan. Domain Managers will coordinate M&S activities and develop and maintain supporting plans for their domains to include Domain Management Plans and Domain Investment Plans.
- b. Domain agents support domain managers by gathering requirements and managing the domain review and approval process. Domain agents are responsible for developing and maintaining a data base of investment information for their assigned M&S. They provide updates to the central investment data base when requested by AMSO.

Table 2-1
Army Model and Simulation Domains

Domain	Domain Activities	Simulations/Simulators
Training, Exercises and Military Operations (TEMO)	<ul style="list-style-type: none">o Individual and Collective Trainingo Joint and Combined Exerciseso Mission Rehearsalo Operations Planning	<ul style="list-style-type: none">o System Simulatorso Training Simulations
Advance Concepts and Requirements (ACR)	<ul style="list-style-type: none">o Force Designo Operational Requirementso Warfighting Experiments	<ul style="list-style-type: none">o Reconfigurable Simulatorso Constructive Models
Research, Development and Acquisition (RD&A)	<ul style="list-style-type: none">o Basic Applied Researcho Weapons System Developmento Test and Evaluation	<ul style="list-style-type: none">o System Prototypeso Engineering and Physics Models

Chapter 3
General Policy Guidance

3-1. M&S life cycle management

For the purposes of life cycle management, Army M&S development efforts will be classified according to the Budget Activities defined in AR 70-1, DoDD 5000.1 and DoD 5000.2-R. Exceptions to this policy are--

- a. M&S developed as system or non-system training devices for education and training will follow AR 70-1 and AR 71-9 for life-cycle management when evaluated as being beyond Research, Development, Test and Evaluation (RDT&E) Budget Activity 6.3 (Advanced Technology Development).
- b. M&S that are developed at scientific and engineering levels for mission applications and corporate business practice models such as those focused on personnel planning and industrial operations will not require centralized management IAW the AR 70 series.
- c. M&S developed for use in Test and Evaluation will be managed over their life cycles in accordance with the responsibilities defined in AR 70-1 and AR 73-1.
- d. A simulation support plan will be developed in accordance with SARD Policy memo, Simulation Support Plans, dated 20 September 1996.

3-2. Embedded M&S

M&S developed as an integral part of weapon system, or other Army operational System will be managed in accordance with the regulations covering the larger system. However, the verification, validation, and accreditation and requirements portions of this regulation will be adhered to for ensuring the internal integrity of such M&S.

3-3. DoD Interoperability

a. DoDD 5000.59 establishes DoD policy, assigns responsibilities, prescribes procedures for the management of M&S, and establishes DMSO which serves as the DoD focal point for M&S. This regulation instantiates those policies and procedures for the Army.

b. The High Level Architecture (HLA) has been designated as the standard technical architecture for all DoD simulations. This mandate for HLA compliance supersedes all previous requirements for DoD simulations to comply with other simulation standards such as DIS or Aggregate-Level Simulation Protocol. All Army simulations will meet DoD standards. HLA establishes a common high-level simulation architecture to facilitate the interoperability of all types of simulations among themselves and with Command, Control, Communications and Intelligence (C4I) systems. The HLA will also facilitate the reuse of M&S as the Army moves into an era of federations of simulations producing synthetic battle environments across all domains.

c. The Technical Architecture Framework for Information Management (TAFIM) has been designated by the Assistant Secretary of Defense for Command, Control, Communications and Intelligence as the single framework to promote the integration of DoD information systems. All new DoD information systems development and modernization programs, to include M&S, will conform to the TAFIM. Evolutionary changes to migration systems will be governed by conformance to the TAFIM. The TAFIM is maintained by the Defense Information Systems Agency (DISA) and is available electronically via the DISA On-line Standards Library.

d. All Army M&S will be compatible with the Joint Technical Architecture - Army (JTA - Army). M&S implementors shall specifically use, but not be limited to--

(1) Section 2 (Information Processing Standards) - specifically the acceptable programming languages,

(2) Section 4 (Information Modeling and Data Exchange Standards), and

(3) Appendix G (Modeling and Simulation Standards).

3-4. Model and Simulation Resource Repository (MSRR)

AMSO hosts the Army node of the DoD Model and Simulation Resource Repository (MSRR). The MSRR is a distributed client server network of M&S information. Assets include instance databases, metadata, M&S Community Directories, models, simulations, algorithms, tools and documents. All assets on the MSRR are subject to the specific releasability policies of the providing organization. The Army policy for the release of data is found in paragraph 7-6 and the policy for release of M&S is found in Chapter 8. The MSRR consists of a series of World-Wide-Web (WWW) servers accessible through the Internet or the Defense Information Services Network (DISN). The key MSRR nodes are at the DMSO and the military services.

a. AMSO is the proponent of the official Army repository of activities associated with the development, improvement, VV&A, and configuration management of Army models and simulations throughout their associated life cycle.

b. All Army M&S shall be included in this repository. Exceptions to this policy are those M&S that are developed at the engineering level for one-time application.

c. In order to eliminate unnecessary duplicative activity by M&S proponents, AMSO serves as the Army single point of contact for provision to other DoD repositories and bulletin board systems.

Chapter 4

The Army Model and Simulation Management Program

4-1. Program goals

The Army Model and Simulation Management Program (AMSMP) promotes two complementary goals - standardizing how the Army conducts modeling and simulation, and ensuring the Army is abreast of new technologies that may be useful in Army M&S applications. In order to make the most of M&S, the Army continues to evolve common methods, procedures, techniques, algorithms, and representations of basic functions. Common use and reuse are fundamental standards development objectives. The Army must maintain contact with cutting edge technologies and applications to ensure that Army M&S remain technologically advanced.

4-2. Concept

Two programs directly support AMSMP goals - The AMIP and the SIMTECH Program.

a. *AMIP*. The AMIP directly supports the technical M&S standards development goals of the Army. Each fiscal year, Army Standards Category Coordinators (SCCs), as designated in the Army M&S Master Plan, nominate M&S projects that will further standards development objectives within their respective standards categories.

(1) *Standards Category Reports and AMIP nominations*. Each SCC annually submits a report on the status of standards development within assigned categories. The report also discusses the most important standards development objectives for each standards category. Projects nominated to support those objectives are attached to each SCC report. The SCC prioritizes multiple nominations to indicate which projects show the most promise for advancing standards development within each category.

(2) *AMIP selections and funding*. All projects submitted by each SCC are considered by the AMSMP WG which prioritizes them for funding. Once reviewed by the AMSEC and approved by the DUSA(OR), projects are funded according to their priority and available funds. Projects may be funded over multiple years, but must compete each year against all other projects submitted for funding that year.

b. *The SIMTECH Program*. The SIMTECH program focuses on accelerating the development of emerging technologies that show promise for improving the art and science of modeling and simulation. The program also seeks to develop technologies that show potential for supporting Army M&S standards development objectives. Specific SIMTECH program goals are to--

(1) Improve M&S development and modification techniques.

(2) Ensure Army M&S more easily and accurately represent complex processes.

(3) Develop less expensive technologies that maintain or improve Army M&S quality.

(4) Develop techniques that increase M&S interoperability among and between domains.

(5) Provide state-of-the-art environments in Army commands and agencies that will attract and retain highly skilled personnel for M&S research and development.

c. *Programs*. Both the AMIP and SIMTECH program are managed by the AMSO with AMSEC oversight.

4-3. Management

a. *Program Planning Cycle*. The program planning cycle is conducted in conjunction with the AMSEC. AMSO will provide amplifying guidance for funding in each fiscal year (FY).

(1) The annual cycle is conducted during the last quarter of the FY. SCCs submit their reports and AMIP project nominations, and AMSEC members submit their SIMTECH Program project nominations. The AMSMP working group then reviews all AMIP and SIMTECH project nominations and prepares a prioritized list of projects for each program. Next, the AMSEC reviews the AMSMP WG list and makes recommendations to the DUSA(OR) who is the final approval authority for AMIP and SIMTECH project funding during the following FY.

(2) Prior to programmed funding execution, each organization that has a project(s) selected for funding must submit an implementation plan(s) to AMSO. Each implementation plan will describe specific project goals and objectives and include milestones for accomplishment. AMSO will publish specific due dates and formats for implementation plans shortly after projects are selected for funding. AMSMP funds will not be disbursed without a viable implementation plan.

b. The Army Model and Simulation Standards Report is published annually by AMSO at the beginning of each FY. This report provides a status report for each standards category, using the SCC annual reports and information on AMIP and SIMTECH Program projects selected for funding each year.

c. Each organization receiving AMIP or SIMTECH Program funding will submit a written status report and conduct an in-process review (IPR) for AMSO. Status reports will contain a brief project description and major accomplishments. AMSO will provide specific information on the report format, transmission mode and due date. The individual reports will be consolidated into The Army Model Model Improvement Program (AMIP) and Simulation Technology (SIMTECH) Program Stewardship Report for the AMSEC.

4-4. Resources

a. *General.* The AMSO will prepare and defend the necessary Management Decision Package (MDEP) submissions to resource the AMIP and SIMTECH Program Operations and Maintenance Army (OMA) accounts. AMSO will coordinate with AMSEC organizations using M&S to determine future automation equipment requirements to support AMIP and SIMTECH Program projects. AMSO will prepare documents, based on the timely input of requirements from AMSEC organizations requiring Other Procurement Army (OPA) funded equipment, for submission to ODISC4 as the OPA account manager for HQDA automation accounts. AMSEC organizations will ensure that AMIP and SIMTECH automation equipment requirements are included in their agency's Army Enterprise Architecture Master Plan.

b. *AMIP or SIMTECH funding.* The AMSO is responsible for complying with the resourcing requirements for that portion of M&S funded with HQDA funds under either the AMIP or SIMTECH programs. MACOMS and agency heads will forward financial, program management and schedule information to the AMSO, as requested, to meet this responsibility.

Chapter 5

Verification, Validation, and Accreditation

5-1. General policy

a. In accordance with the guidance in DoDD 5000.59 and DoDI 5000.61, a systematic plan of verification, validation, and accreditation (VV&A) is required for all Army M&S. Although paragraph 3-1 provides exceptions for M&S not requiring centralized management, a VV&A plan is encouraged to build credibility for their use.

b. *New M&S development.* Verification and Validation (V&V) are an integral part of the life cycle management process for all M&S developed after June, 1992. Planning V&V shall be accomplished at the initiation of development and shall include programming of V&V resources as an integral part of the acquisition strategy.

c. *Legacy M&S.* For V&V purposes, legacy M&S are those M&S developed prior to June 1992 which are still in use but are not implemented using today's V&V standards. V&V of legacy M&S is strongly encouraged, and should be accomplished as appropriate, considering future applications, availability of resources, and future M&S replacements for the legacy M&S. V&V of major modifications to legacy M&S begun after June 1992 are required. Accreditation of legacy M&S does not differ from that for newly developed M&S.

d. VV&A will be accomplished in concert with, and as part of, the overall configuration management for each M&S.

e. VV&A activities will include assessments of the representations of concepts, tactics, forces, processes, and doctrine, from both friendly and opposing force perspectives. VV&A of opposing forces (threat portrayal) will be performed in coordination with the appropriate intelligence authority (see AR 381-11) to ensure conformance with established intelligence positions and assessments.

f. VV&A for a federation of M&S will adhere to not only the general VV&A policies and procedures for each individual M&S, but will also consider system compliance, compatibility, and interoperability requirements. VV&A of a federation will ensure credible results of the integrated system as a whole. Each unique application configuration of a federation requires VV&A.

g. VV&A activities will be included in the simulation support plan required for all Army acquisition strategies for Acquisition Category I and II and non-major programs. A summary of the VV&A status of M&S used or proposed for use to support test and evaluation for an acquisition program, to include resources required, will be included in the program's Test and Evaluation Master Plan (see DoD 5000.2-R).

h. The Army shall be the final authority for validating representations of its own forces and capabilities in joint, general, and common-use applications and shall be responsive to the other Services and Defense agencies to ensure that its forces and capabilities are appropriately represented. Army developers of M&S which represent the activities of other Services will coordinate the VV&A with that DoD component.

i. For an Army agency designated as a DoD M&S Executive Agent (MSEA), the Army agency will follow Army VV&A policies and procedures for that M&S application unless otherwise specified by the Under Secretary of Defense for Acquisition and Technology.

j. M&S used to support major DoD decision making organizations and processes (such as the Defense Planning and Resources Board (DPRB); the Defense Acquisition Board (DAB); the Joint Requirements Oversight Council (JROC); and the DoD Planning, Programming, and Budgeting System (PPBS)) will be accredited specifically for that usage by the applicable Army application sponsor.

k. VV&A considerations will be included in study tasking documents for all Planning, Programming, Budgeting, and Execution System (PPBES) supporting analyses. A summary of the VV&A status of M&S used or proposed for use to support POM decisions will be included in the analytical study plan.

l. AMSO is designated as the Army's DoD VV&A Focal Point. AMSO will serve as the authoritative, single point of contact for DoD and non-DoD activities concerning the data and information on Army VV&A policies, procedures, and practices, VV&A results, and accreditation documentation. AMSO may delegate specific responsibilities to other agencies.

5-2. Verification and Validation

a. *Purpose.* The purpose of V&V is to provide a foundation for the accreditation process in order to ensure the suitability of the M&S for its intended application.

b. *Scope.* V&V shall be commensurate with the relative importance and stage of development of the M&S or federation to which they are applied.

c. Proponency. The M&S proponent is responsible for V&V. Execution of this responsibility may be delegated to a V&V agent. The following special cases apply--

(1) For a federation of M&S, the federation sponsor is the V&V proponent and shall designate the V&V agent.

(2) For M&S developed and maintained by a non-DoD government agency, Federally Funded Research and Development Center (FFRDC), academic institution, or contractor in support of a major Army decision process, the Army application sponsor will ensure that V&V have been performed on the M&S and will ascertain its V&V status. This may be accomplished by including a requirement for documentation of the V&V activities and stipulation of acceptability criteria in the Request for Proposal (RFP), Statement of Work (SOW), or other contract documents.

(3) An Army agency designated as a DoD MSEA has both Army and DoD responsibility for V&V of DoD common-, general-, or joint-use applications.

(4) Army TRADOC Analysis Center (TRAC) is designated as the Army V&V Process proponent for DIS and will be responsible for maintaining and documenting the baseline for common V&V tools, processes, and procedures

d. Verification.

(1) Verification is the process of determining if the M&S accurately represents the developer's conceptual description and specifications and meets the needs stated in the requirements document. The verification process evaluates the extent to which the M&S has been developed using sound and established software engineering techniques, and establishes whether the M&S logic and code correctly perform the intended functions. Verification methodology is provided in greater detail in DA Pam 5-11.

(2) M&S verification includes appropriate data verification and M&S documentation (e.g., programmer's manual, installation guide, user's guide, analyst's manual, and trainer's manual).

(3) Verification should be performed by an independent agent from the M&S developer. However, as a general recommended practice, the developer is expected to conduct in-house verification and testing to assist in the overall M&S development process.

e. Validation.

(1) Validation is the process of determining the extent to which the M&S adequately represents the real-world from the perspective of its intended use. Identification of real world data sources as well as structural validation and output validation methods are described in greater detail in DA Pam 5-11.

(2) The validation process ranges from single modules to the entire system. The ultimate purpose is to validate the entire system of M&S, including data.

(3) Validation methods will incorporate documentation of procedures and results of all validation efforts to assist in the accreditation of M&S.

5-3. Accreditation

a. Accreditation is an official determination that the M&S is acceptable for its intended purpose. It is based on experience and expert judgment and includes--

(1) Consideration of the extent to which V&V have been accomplished. If commercial off-the-shelf (COTS) M&S are included as part of the accreditation decision, the application sponsor will consider the V&V history of the COTS products.

(2) Other factors which impact the decision for approval and use, e.g., developer's past history, hardware configuration required, software support environment, personnel, security and known limitations.

b. Accreditation is a management responsibility of the application sponsor, assisted by the V&V proponent. The specific use of the M&S must be considered in context with its capabilities and limitations. Accreditation includes data inputs, scenarios, and the operators-analysts-trainers who will use the M&S.

c. The application sponsor will designate an accreditation agent to conduct the accreditation assessment for that specific application.

d. An Army agency responsible for the application of a federation of M&S also has accreditation responsibility. Each of the M&S federation elements within the federation may undergo V&V according to the owning Service V&V policies and guidelines, but the Army agency application sponsor is responsible for the overall federation accreditation.

e. Subject to approval by the AMSEC, an M&S may be accredited for a generic set of applications, e.g., CG, TRADOC, may credit an M&S for the general class of Training applications. Although an M&S may be granted this generic class accreditation, each specific usage of that M&S still requires accreditation by the specific application sponsor. Each specific application can use the class of applications decision as a baseline for focusing VV&A effort on the unique aspects of the application.

5-4. Documentation of the VV&A Process

a. *V&V documentation.* The V&V proponent will prepare an assessment plan and report of V&V activities for use by the accreditation agent.

(1) The plan will contain management actions (e.g., identification of verification agent and validation agent, tasks, schedule, and resources) and analysis actions (e.g., scope, limitations, constraints, methodology, sources of data, and evaluation criteria).

(2) The report will include a description of the real world entity or process to be represented, intended purpose of the M&S and its design requirements, M&S version number(s), description of the V&V activities performed, extent to which the M&S met the evaluation criteria, and recommendations for modifications required to improve M&S credibility (if appropriate).

b. Accreditation documentation.

(1) In conjunction with the V&V proponent, the accreditation agent will prepare an accreditation plan and report.

(a) The plan will identify the intended purpose, members of the accreditation team, resources and milestones, documentation required (e.g., current M&S configuration, past V&V efforts, post-V&V enhancements), acceptability criteria, and proposed accreditation methodology to include data verification, validation, and certification (VV&C).

(b) The report will contain background, description of the M&S to include version number(s), data VV&C results, evaluation of the M&S, V&V activities that support accreditation, and accreditation agent recommendations as they affect the appropriateness of the M&S or federation for the intended purpose. The report will include the assumptions; scenarios; representations of concepts, tactics, techniques, and procedures; and forces, processes, and doctrine from both friendly and opposing force perspectives as used in the M&S. Other considerations which affect the accreditation decision (see paragraph 5-3 a(2)) will also be included.

(c) The report will include the application sponsor's decision on whether or not to accredit the specific M&S or federation for the intended application. Based on the determined risk (if any) of using the M&S or federation for the intended application, the M&S or federation could be accredited as is, M&S improvements could be implemented followed by further V&V and reassessment, another M&S could be considered, or a different approach could be utilized. The plan and report will be provided to the M&S proponent and the application sponsor. A copy of the accreditation decision will be sent to AMSO who will keep a record of M&S accredited.

(d) The accreditation of a federation of M&S shall include a determination that--

1. Federation elements can appropriately exchange data.

2. Data items being exchanged are accurate and comparable across the federation to the extent required.

3. Response times are commensurate across all system elements.

4. The federation is complete and the degree to which it meets real world behavior, appearance, performance, fidelity, and interoperability expectations for the intended purpose.

5. Security classification levels of the federation and data are appropriate and commensurate with the application.

(2) The M&S proponent shall enter and maintain their M&S VV&A history information in the official Army repository of activities as directed in paragraph 3-5.

5-5. Reaccreditation

If the AMSEC has approved an M&S for a generic set of applications (see para 5-3e), the M&S will be subject to reaccreditation when--

- a. The M&S is proposed for a new type of application;
- b. A new reference version of the M&S is released; or
- c. A period of three years of active use has passed since the last accreditation for that class.

5-6. Funding

a. Resources required to perform VV&A will be identified in Command Operating Budget (COB) submissions of M&S developers, users, and VV&A proponents as a part of the resource requirements for M&S development and maintenance.

b. V&V costs shall be identified in the acquisition strategy for contractor developed M&S.

c. To gain funding visibility, a separate line shall be established reflecting V&V for each M&S activity contained in Management Decision Packages (MDEPS).

Chapter 6

Configuration Management

6-1. Objective

The objective of configuration management (CM) is to improve the consistency and reliability of M&S. CM shall be applied throughout the life cycle of all M&S covered by this regulation to ensure continuing operational consistency. The policies in this chapter are to ensure uniformity of CM procedures and practices throughout the Army.

6-2. Scope

a. CM focuses on four areas of activity--

(1) *Configuration identification.* Selecting documents that identify and define the baseline configuration characteristics of the M&S. In some cases, pre- and/or post-processors are considered part of the baseline configuration of the M&S (See para 6-4a).

(2) *Configuration control.* Controlling changes to the baseline configuration and its identification documents.

(3) *Configuration status accounting.* Recording and reporting changes to the baseline configuration and its identification documents.

(4) *Configuration audit.* Checking copies of the M&S in use for compliance with the baseline configuration.

b. The implementation of a CM process will--

(1) Enable all concerned to identify the current status of the M&S and eliminate any questions as to which is the current version.

(2) Enable all authorized users to have the current M&S and associated documents available at all times so that none are working with out-of-date material.

(3) Ensure that no changes are made to the M&S baseline without proper review and approval, preserving the M&S' intended purpose, schedule, and cost.

(4) Provide an audit trail for everything that happens during the M&S life cycle history.

c. CM is an integrated process encompassing hardware, software, and firmware. DoDD 5000.1 and DoD Regulation 5000.2-R, govern Army CM activities.

d. Commercial standards comparable to MIL-STD-498 will be used for software development and documentation; commercial standards comparable to MIL-STD-973 will be used for configuration management.

6-3. Policy

a. The M&S Proponent is responsible for, but may delegate execution of, CM. This responsibility may be delegated to the developer. CM shall be applied to M&S developed wholly or partly with Army funding. The degree of CM shall be tailored to complexity, size, quantity, intended use, mission, and life-cycle phase.

b. CM for Army M&S will be conducted according to DoD 5000.2-R, paragraph 4.3.

c. Pre- and post-processors will be included in the CM of the M&S.

6-4. Process

a. CM defines the baseline configuration of the M&S which cannot be altered without a formal change control process. The baseline configuration should focus on those M&S related items which have the following characteristics in common--

(1) Potentially evolutionary in character.

(2) Are part of the M&S life cycle development process and are under the control of the development team.

b. A CM plan is developed and implemented to control the baseline M&S. As a minimum, the CM plan will address and implement the following interrelated processes--

(1) A formal procedure for controlling any changes to the baseline.

(2) A set of procedures for controlling the distribution of the baseline M&S after changes have been made.

(3) A set of procedures for identifying revisions and updates to the different baseline versions of the M&S.

(4) Maintenance of the current baseline configuration and an audit trail.

c. The CM process should be designed to provide suitable checks and balances so that required changes can be made in a timely manner. Further, it must be audited to ensure that records, procedures, and time elements are intact and regulations are enforced. For this reason, it is important to develop a well-organized CM program.

6-5. Users Groups

The organization responsible for the execution of CM (hereafter referred to as Configuration Manager) will establish user groups for M&S that are used by two or more agencies.

a. *Purpose.* Information to be exchanged by the users group will include M&S enhancement for types of applications, and data used by others with the M&S, as well as any problems encountered with its use. The group will address the following CM issues--

(1) Configuration of the reference version.

(2) Proposed enhancements to the next reference version.

(3) Methodologies for verification and validation of the reference version and changes thereto.

(4) Documentation of enhancements made by users other than the Configuration Manager.

b. *Membership.*

(1) *Government.* Membership will be open to appropriate U.S. Government organizations. This will normally include all U.S. Army agencies and HQDA staff elements with an interest in the structure or use of the M&S.

(2) *Non-government (including FFRDCs).* Membership for non-government and foreign government organizations will normally be authorized by the Configuration Manager only for the period of time to coincide with their actual participation in a cooperative venture with the U.S. Government or support of an active U.S. government contract requiring use of the M&S.

(3) *Executive Committee.* An Executive Committee will normally be formed from among selected user group representatives of the

primary Army activities using the M&S. The Executive Committee usually assists the M&S proponent in the evaluation and approval of recommended changes to the M&S.

Chapter 7

Data Management

7-1. General

The management of Army M&S data is governed by the DoDD 8320 series. It is the foundation of the Army Data Management and Standards Program and supports the Army Information Resources Management Program (AR 25-1). AR 25-1 establishes the necessary framework for identifying, organizing, and managing Army data to support the development and implementation of information systems which are interoperable within and among the tactical, strategic and sustaining base environments. The data management program addresses the management of manually processed and automated data from data modeling to the data element level. Data and information that are communicated and shared across organizational boundaries will conform to the policies and standards outlined in the Department of the Army C4I Technical Architecture. The data management program requires the active involvement of both functional experts and materiel developers. The program assists the Army in understanding what the information requirements are, where official Army data is maintained, and who uses the data. The program includes the activities of strategic data planning, data element standardization, data synchronization, data security, information management control, and database development and maintenance.

7-2. Management goals

To ensure consistent results from all Army M&S, M&S data management goals must conform with the goals of the Army data standards program. They are to--

- a. Provide a common set of verified, validated, and certified data which can be shared by Army M&S activities;
- b. Facilitate internal, joint, and combined interoperability through the standardization and use of common data; and
- c. Improve data quality and accuracy, and to minimize the cost of data production and data maintenance according to DoDD 8320.1 and DoDD 8320.1 M.

7-3. Management guidelines

- a. Data, information, and information technologies used in support of M&S are corporate assets and shall adhere to the information management policies contained in DoDD 8000.1.
- b. Data and Activity models must be developed to support management activities for data and information, and activities required to achieve the mission, business goals, and objectives of DoD data management programs. Data and activity models provide the link needed to unify functional planning, modeling, and implementation activities into a coherent organization or functional activity. These models are used to develop and maintain DoD standard data elements. Models should be created using the Integrated Computer-Aided Manufacturing Definition (IDEF) language. IDEF0 and IDEF1 X are the DoD standard presentation styles for activity and data modeling. Note: IDEF is a specific software tool used to model processes. It is not a general purpose computer language.
- c. Standardization of data such as prime words, data elements, class words, and generic elements will be done in accordance with the procedures in DoDD 8320.1-M, appendix E.
- d. The Defense Data Repository System (DDRS) is a centrally controlled DoD-wide data repository to receive, store, support access to, and manage standard data definitions, data formats, usage, and structures (e.g., architecture, subject area models, and other data model products). DoDD 8320.1-M-1, DoD Data Elements Standardization Procedures, describes the procedure for developing and submitting candidate standard data. DISC4 is designated Component Data Administrator (CDA) for Army.

AMSO is designated by DISC4 as the CDA for Army M&S standards.

7-4. Verification, validation, and certification of data

Data used in models and simulations should be verified, validated, and certified for use in specific applications. Data verification, validation and certification (VV&C) ensures that the data used in M&S applications is credible and constitutes the best available data for that use. Both data producers and data users perform VV&C of data. The data producer and data user, in some cases, may be the same organization. The separate definitions of data producer and user VV&C are found in the glossary. The definitions describe the roles of the data producer and the data proponent in that step of the process.

7-5. Digital topographic data

The U.S. Army Corps of Engineers (USACE) Topographic Engineering Center (TEC) is the point of contact for all Army Digital Topographic Data (DTD) requirements for standard products. MA-COMs and agencies developing M&S that require DTD products shall design M&S to utilize standard National Imagery and Mapping Agency (NIMA) DTD products. Army Commands and Agencies developing DTD will produce DTD to a standard NIMA product specification or format and provide one copy to the NIMA for quality assurance (QA) checks and VV&C. Exceptions may be granted by NIMA.

7-6. Release of data

a. For release of M&S data to other U.S. government agencies, U.S. contractors, FFRDCs, foreign governments and international organizations through other than Foreign Military Sales (FMS), the release approval authority is the commander or agency head of the organization which is the data proponent for either instance data or sets of data. Designation or release approval authority can be delegated to lower levels as defined in appendix B, paragraph B-2. Procedures for the release of M&S data to foreign governments and international organizations through FMS are found in paragraph 8-8.

b. M&S data requests should be made directly to the data proponent organization. Requests for data made to organizations other than the data proponent should be forwarded to the data proponent for action. The data request must, at a minimum--

(1) State the specific requirements and intended use of the data. The requester may also be asked to provide an assessment of the impact of not releasing the data.

(2) Use the standard data names found in the Defense Data Dictionary System (DDDS).

(3) Cite the Cooperative R&D Agreements (IA) or Data/Information Exchange Annexes/Agreements (DEA/IEA) if the request is being made by a foreign government a foreign or an international organization.

c. Upon receipt of the request the data proponent will, at a minimum--

(1) Ensure the data requester has a "need to know," the proper security clearances, and the ability to safeguard the data according to AR 381-11.

(2) Verify, validate, and certify the data, providing the requester, in writing, any constraints and caveats placed on the data.

(3) Make data available for transmission in a machine readable format per the Army policy for open systems environment.

(4) Ensure, if appropriate, the DEA/IEA Delegation of Disclosure Authority Letter (DDL) paragraph 5 clearly specifies this type of M&S data can be released or that paragraph 6 does not state that this type of M&S data will not be released to the requesting foreign government or international organization.

(5) Forward an information copy of the request and the disposition to the DUSA(OR), 102 ARMY PENTAGON, ATTN: SAUS-OR, WASHINGTON, DC 20310-0102.

d. If the data is being released to a U.S. contractor or FFRDC to support a specific government effort, the requesting organization will prepare a memorandum (MOA) which states--

(1) The receiving contractor or FFRDC will use the data only for the purpose stated in the request and will not release the data to third parties.

(2) Upon completion of the contract work calling for its use, the data will be returned to the data proponent unless otherwise provided for in approved contracting documents.

(3) All data will be protected per AR 381-11.

Chapter 8

Model and Simulation Release

8-1. Concept

M&S is considered intellectual property. Accordingly, it is prohibited to place M&S in the public domain. This chapter describes policies applicable to the release of all Army M&S covered by this regulation. Policies to prescribe the FMS of M&S data are described in paragraph 8-8. Procedures for the release of M&S data through other than FMS are described in paragraph 7-6. The factors to determine releasability (i.e., requirement, technical competence, and security) and the levels of release authority are listed in Appendix B. All requests must be initiated by a government organization, either foreign or domestic. The procedure to be followed is determined by the category of the M&S recipient. The three categories of M&S recipients are--

- a. Other U.S. government organizations;
- b. contractors and FFRDCs; and
- c. Foreign governments and international organizations.

8-2. Background

The need to control the release of M&S becomes ever more important as the technology matures. The Army has a responsibility to examine each release from both a security and a legal/fiscal aspect. Many of today's M&S have weapon system performance and force structure information directly embedded, therefore a release request must be analyzed to determine if the requester has a valid requirement and if the information is releasable. Additionally as software techniques become more sophisticated, the need to safeguard our investment in emerging technologies increases. For M&S that contain proprietary software, guidance from the Contracting Officer and supporting legal office regarding the legality of such a release must be sought.

8-3. Release approval authority

For release of M&S to other U.S. government agencies, U.S. contractors, and FFRDCs, the release approval authority is the MACOM commander or agency head of the organization which is the M&S proponent of the requested M&S. Designation of release approval authority can be delegated to lower levels as defined in appendix B, paragraph B-2. For release of M&S to a foreign government or an international organization, the DUSA (OR) is the final release approval authority; this will not be delegated to a lower level. For release of M&S with multi-service proponentcy, release approval must be coordinated with each Service concerned prior to release by the Army approval authority.

8-4. Release to other U.S. Government agencies

a. Requests to release Army M&S to other U.S. Government agencies including inter- and intra-Service are made directly to the Army M&S proponent organization. The M&S proponent and the receiving organization will negotiate conditions of release, including any fees associated with the transfer.

b. The M&S proponent organization will obtain approval from the MACOM release approval authority.

c. After approval has been granted the M&S proponent organization will prepare an MOA which states the following minimum conditions, that the U.S. government organization receiving the M&S will--

(1) Not release it to third parties without written approval from the release authority.

(2) Use the M&S only for the purpose(s) stated in the MOA.

(3) Abide by all configuration control procedures established by the Configuration Manager.

(4) Provide copies to the M&S proponent of any modifications or enhancements made or proposed.

(5) Return to the Configuration Manager or otherwise erase all code associated with the M&S upon completion of the work for which the M&S was requested.

8-5. Release to U.S. contractors and FFRDCs

a. Requests to release Army M&S to a U.S. contractor or FFRDC must be made by the government agency sponsoring the work of the U.S. contractors or FFRDC. The request is made directly to the Army M&S proponent organization. In the event the requesting organization is the same as the proponent organization, the same procedures will be followed. Each request will state the government's specific requirement for the contractor to have access to the M&S and an assessment or impact of not releasing the M&S. Requests for Army M&S will not be accepted directly from a contractor or FFRDC. If the proponent requires reimbursement of costs or fees associated with the release or transfer, these will be negotiated with the requesting organization prior to requesting MACOM approval for transfer.

b. The M&S proponent organization will obtain approval from the MACOM release approval authority.

c. After approval has been granted, the U.S. Government organization sponsoring the contractor or FFRDC work will execute one of the following--

(1) A modification to the original contract stating the conditions under which the M&S is released. The minimum conditions are in paragraph 8-5c (2).

(2) An MOA with the M&S proponent which states the following minimum conditions, that the contractor or FFRDC receiving the M&S will--

(a) Not release it to third parties without written approval from the release authority.

(b) Use the M&S only for the purpose(s) stated in the MOA.

(c) Abide by all configuration control procedures established by the Configuration Manager.

(d) Provide copies to the M&S proponent of any modifications or enhancements made or proposed.

(e) Return to the Configuration Manager or otherwise erase all code associated with the M&S upon completion of the work for which the M&S was requested.

(f) Acknowledge the U.S. Government retains the rights to any M&S provided and to modifications or enhancements developed by the contractor or FFRDC. The extent of these rights will be specifically described in the agreement and reviewed by the supporting legal officer.

8-6. Release to media

Requests for Army M&S information from journalists should be referred to the appropriate MACOM or installation Public Affairs Officer (PAO) for coordination.

a. PAOs, after coordination with appropriate agencies and subject-matter experts, will assist journalists in obtaining information in a manner that appropriately represents the U.S. Army.

b. Release of information will be approved at the lowest appropriate level.

c. National-level media requests or those requests deemed unusual at the local level will be referred to the WEAPONS AND TECHNOLOGY TEAM, OFFICE OF THE CHIEF OF PUBLIC AFFAIRS, ROOM 2E637, THE PENTAGON, WASHINGTON, DC 20310-1500.

8-7. Release to foreign governments and international organizations

a. Release of Army M&S and data to foreign governments and international organizations can be accomplished through one of the following--

- (1) FMS.
- (2) Cooperative R&D IAs DEAs/IEAs.
- (3) On a strict case by case basis, when neither of the above are applicable.

b. Neither Army M&S nor data will be released directly to foreign contractors. Requests for release to foreign contractors must be initiated by the government or organizations requiring the Army M&S to support an existing effort.

8-8. Procedure for Foreign Military Sales (FMS)

a. A foreign government or international organization interested in purchasing Army M&S or data through FMS may submit a request for Price and Availability (P&A) data for preliminary planning or a Letter of Offer and Acceptance (LOA) to the U.S. Army Security Assistance Command (USASAC), Alexandria, VA. USASAC will--

(1) Obtain a recommendation concerning the release of the requested M&S and/or data from the M&S proponent. This recommendation must identify other countries or international organizations to which this information has previously been released, and include a system description of the requested M&S and/or data and a Sensitivity of Technology Statement. The Sensitivity of Technology Statement should include foreign disclosure approval from the proponent security office; the classification level of the M&S and/or data requested, and the requested M&S and/or data version number.

(2) Provide this recommendation to the Deputy Under Secretary of the Army (International Affairs) (DUSA (IA)) Directorate for International Development and Security Assistance (SAUS-IA-DSA-C) with the request that approval to release the M&S will be sought from the DUSA(OR) or approval for the release of the data from the data proponent.

b. SAUS-IA-DSA-C will coordinate the recommended sale with other appropriate HQDA elements, to include as a minimum, DCSINT (DAMI-POC) and Office of the Secretary of the Army (OSA), and the Office of the General Counsel (OGC). If the DUSA(OR) approves the release of the M&S or the proponent approves the release of the data to the foreign purchaser, USASAC will be advised by SAUS-IA-DSA-C that the P&A data or LOA may be developed and provided to the foreign purchaser. An LOA must include notes which specify the following minimum conditions--

- (1) That the M&S/data will only be used for the purpose approved.
- (2) That the foreign purchaser will abide by all configuration control procedures established by the Configuration Manager.
- (3) That the U.S. government will be provided copies of any modifications or enhancements made or proposed to the Configuration Manager.
- (4) That the M&S or data will not be released to anyone who is not an officer, employee, or agent of the purchaser, without the prior written consent of the U.S. Government.

8-9. Procedure to request the transfer of Army M&S through other than FMS

a. All requests for non-FMS release of Army M&S should be initiated by the foreign government or international organization and submitted directly to the DUSA(OR), 102 ARMY PENTAGON, ATTN: SAUS-OR, WASHINGTON, DC 20310-0102.

b. Upon receipt by the DUSA(OR) the request will be forwarded to the AMSO for action. AMSO will designate a release sponsor for the purpose of coordinating concurrence with the organizations which have proponentcy for and/or are the originator of the requested M&S. Any fees associate with the M&S release will be negotiated by the release sponsor and the foreign government, with participation by AMSO, as representative of the DUSA(OR). Requests for M&S data will be handled separately and will follow the procedures specified in paragraph 7-6.

c. The release sponsor will first contact the M&S proponent organization to obtain approval from the MACOM release approval authority. The MACOM approval authority must obtain appropriate foreign disclosure approval from the MACOM security office.

d. If the request is being made under an existing IA/DEA/IEA the release sponsor will then coordinate with the Technical Project Officer (TPO) or appropriate Action Officer designated in the IA/DEA/IEA. The TPO will provide written concurrence for release if the--

- (1) M&S is releasable under the IA/DEA/IEA.
- (2) DEA/IEA DDL paragraph 5 clearly specifies this type of M&S will be released to the requesting foreign government or that paragraph 6 does not state that this type of M&S will not be released to the requesting foreign government.

e. If the request falls outside the scope of an existing IA/DEA/IEA, the release sponsor obtains concurrence by forwarding the request sequentially through--

(1) U.S. ARMY MATERIEL COMMAND, INTERNATIONAL COOPERATIVE PROGRAMS ACTIVITY, ATTN: AMXIP-OM, 5001 EISENHOWER AVE., ALEXANDRIA, VA 22333-0001.

(2) DUSA(IA), DIRECTORATE FOR INTERNATIONAL DEVELOPMENT AND SECURITY ASSISTANCE, INTERNATIONAL COOPERATION DIVISION, ATTN: SAUS-IA-DSC, 102 ARMY PENTAGON, WASHINGTON, DC 20310-01023, WHO WILL COORDINATE WITH--

(a) HQDA DEPUTY CHIEF OF STAFF FOR INTELLIGENCE, 1000 ARMY PENTAGON, ATTN: DAMI-POC, WASHINGTON, 20310-1000.

(b) HQDA OFFICE OF THE GENERAL COUNSEL, 104 ARMY PENTAGON, ATTN: OSAGC, WASHINGTON, DC, 20310-0104.

f. Once the process defined above is completed the package is then returned to AMSO for final review and a recommendation for approval/denial is sent to the DUSA(OR). AMSO will notify the release sponsor and the requesting government on the disposition of the request. If approval is granted, the release sponsor will notify the above offices and forward the release through prescribed Army/MACOM command channels/procedures for the release of information to foreign governments.

Appendix A References

Section I Required Publications

AR 70-1

Army Acquisition Policy (Cited in para 3-1a.)

AR 71-9

Materiel Objectives and Requirements (Cited in para 3-1.)

AR 381-11

Threat Support to U.S. Army Force, Combat, and Materiel and Training Development (Cited in paras 5-1e and, 7-6c.)

DoD Directive 5000.59

DoD Modeling and Simulation (M&S) Management (Cited in para 2-2a.)

DoD 8320.1-M

Data Administration Procedures (Cited in para 7-2 and 7-3.)

DoD 8320.1-M-1

DoD Data Element Standardization Procedures (Cited in para 7-3d.)

DoD Directive 5000.1

Defense Acquisition (Cited in para 3-1 and 6-2.)

DoD Regulation 5000.2-R

Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs (Cited in para 3-1.)

DoD Directive 8000.1

Defense Information Management Program (Cited in para 3-4a.)

DoD Directive 8320.1

DoD Data Administration (Cited in para 7-2.)

DoD 5000.59-P

Department of Defense Modeling and Simulation (M&S) Master Plan (Cited in para 2-6f and 3-3a.)

DoDI 5000.61

Department of Defense Modeling and Simulation (M&S) Verification, Validation, and Accreditation

DoD Manual 8320.1-M-x

DoD Enterprise Data Model Development, Approval, and Maintenance Procedures (Cited in para 7-3d.)

DoD Manual 8320.1-M-1

Data Element Standardization Procedures

MIL STD 498 (will be replaced by commercial standards)

Software Development and Documentation (Cited in para 6-2d.)

MIL STD 973

Configuration Management (Cited in para 6-2d.)

Department of the Army Model and Simulation Master Plan

Department of the Army Model and Simulation Standards Report

DA Pam 5-11

Verification, Validation and Accreditation of Army Models and Simulations

Section II

Related Publications

AR 5-5

Army Studies and Analyses

AR 11-2

Management Control

AR 11-18

Cost and Economic Analysis Program

AR 25-400-2

The Modern Army Record Keeping System (MARKS)

AR 70-33

Mutual Weapons Development Data Exchange Program (MWDDEP) and Defense Development Exchange Program (DDEP)

AR 70-41

Cooperation with Allies and Other Nations in Research and Development of Defense Equipment

AR 380-10

Technology, Transfer, Disclosure of Information and Contacts with Foreign Representatives

AR 381-19

Intelligence Dissemination and Production Support

DA Pam 5-5

Guidance for Army Study Sponsors, Sponsor's Study Directors, Study Advisory Groups, and Contracting Officer's Representatives

DoD Manual 8120.2-M

Automated Information System (AIS) Life-Cycle Management (LCM) Manual

DoD Standard 7935A (will be replaced by commercial standards)

DoD Automated Information Systems Documentation Standards

DoD 5000.59-M (DRAFT)

Glossary of Modeling and Simulation (M&S) Terms

OSA (RDA) Memo

Simulation Support Plans for ACAT I & II Programs, September 20, 1996

STANAG 4482

Standard NATO Agreement - Standardization Information Technology Protocols for Distributed Interactive Simulation (DIS)

IEEE 1278

Institute of Electrical and Electronic Engineers - Standard for Interactive Simulation Protocols for DIS Application

HQDA Memo, DACS-ZB, 262100ZFEB96,

Subj.-- Army Management of Models and Simulations (M&S)

Section III

Prescribed Forms

This section contains no entries.

Section IV

Referenced Forms

This section contains no entries.

Appendix B - M&S Releasability Factors and Levels

B-1. Factors

Releasability refers to the release of both data and the M&S themselves. There are several major factors which must be considered in assessing releasability--

a. Requirement. Determining whether the requested M&S is appropriate for the intended application. If the decision is not to release, alternatives should be suggested or provided that meet the requester's information needs.

b. Technical competence. Determining whether the recipient has the technical ability and training to support running the M&S and using the data properly. An alternative to release in this category is operating the M&S for the requester and assisting in interpretation of the results.

c. Security. Determining if both personnel security and system security requirements can be met for classified applications. This also covers national security implications governing the release of otherwise unclassified M&S to non-US requesters.

B-2. Levels

The authority to release may be granted to differing levels of command depending upon the ultimate recipient. Specific release requirements are specified in chapter 8. The levels to which M&S and data may be released and the associated release authority are grouped as follows--

a. Intraservice. Delegated to MACOM commanders and agency heads and may be redelegated lower.

b. Interservice. Delegated to MACOM commanders and agency heads and may be redelegated one level lower.

c. Intragovernmental. Delegated to MACOM commanders and agency heads and not subject to redelegation.

d. Commercial. Delegated to MACOM commanders and agency heads, but must include contracting considerations.

e. International.

(1) For M&S release through FMS - Retained at HQDA, DUSA(OR), in coordination with other governmental agencies. Will not be redelegated.

(2) For Data release through FMS - In coordination with other government agencies, delegated to MACOM commanders and agency heads. May be redelegated one level lower.

(3) For M&S release through Non-FMS - Retained at HQDA, DUSA(OR) and will not be redelegated.

(4) For data release through non-FMS - Delegated to MACOM commanders and agency heads. May be redelegated one level lower.

Glossary

Section I Abbreviations

AAE

Army Acquisition Executive

ACR

Advanced Concepts and Requirements

ADE

Army Data Encyclopedia

ADO

Army Digitization Office

ADS

Advanced Distributed Simulation

AEA

Army Enterprise Architecture

AFOR

Automated Forces

AIMSSS

Army Information on Models, Simulations, and Studies System

AI

Artificial Intelligence

AIS

Automated Information System

ALSP

Aggregate Level Simulation Protocol

AMC

U.S. Army Materiel Command

AMG

Architecture Management Group

AMIP

Army Model Improvement Program

AMSAA

Army Materiel Systems Analysis Activity

AMS GOSC

Army Model and Simulation General Officer Steering Committee

AMSEC

Army Model and Simulation Executive Council

AMSO

Army Model and Simulation Office

AMSMP

Army Model and Simulation Management Program

AMSMP WG

Army Model and Simulation Management Program Working Group

AR

Army Regulation

ARI

U.S. Army Research Institute for Behavioral and Social Sciences

ASA(FM&C)

Assistant Secretary of Army for Financial Management and Comptroller

ADA (M&RA)

Assistant Secretary of the Army (Manpower and Reserve Affairs)

ASA(RDA)

Assistant Secretary of Army for Research, Development, and Acquisition

AWC

U.S. Army War College

C4I

Command, Control, Communications, and Intelligence

CAA

U.S. Army Concepts Analysis Agency

CASE

Computer Aided Software Engineering

CDAd

Component Data Administrator

CG, TRADOC

Commanding General, U.S. Army Training and Doctrine Command

CGF

Computer Generated Forces

CINC

Commander-in-Chief

CM

Configuration Management

COB

Command Operating Budget

COE

Corps of Engineers

COTS

Commercial Off-The-Shelf

CSA

Chief of Staff of the Army

DAB

Defense Acquisition Board

DARPA

Defense Advanced Research Projects Agency

DAS (R&T)

Deputy Assistant Secretary for Research and Technology

DCG

Deputy Commanding General

DCSINT

Deputy Chief of Staff for Intelligence

DCSLOG

Deputy Chief of Staff for Logistics

DCSOPS

Deputy Chief of Staff for Operations and Plans

DCSPER

Deputy Chief of Staff for Personnel

DDL

Delegation of Disclosure Letter

DDDS

Defense Data Dictionary System

DDRS

Defense Data Repository System

DEA

Data Exchange Agreement

DIS

Distributed Interactive Simulation

DISA

Defense Information Systems Agency

DISC4

Director of Information Systems for Command, Control, Communications, and Computers

DMSO

Defense Modeling and Simulation Office

DoD

Department of Defense

DPRB

Defense Planning and Resources Board

DSI

Defense Simulation Internet

DTD

Digital Topographic Data

DUSA (IA)

Deputy Under Secretary of the Army for International Affairs

DUSA(OR)

Deputy Under Secretary of Army for Operations Research

EUSA

Eighth U.S. Army

EXCIMS

Executive Council for Modeling and Simulation

FFRDC

Federally Funded Research and Development Center

FMS

Foreign Military Sales

FOA

Field Operating Agency

FORSCOM

U.S. Army Forces Command

FY

Fiscal Year

GO

General Officer

HLA

High Level Architecture

HOL

High Order Language

HQDA

Headquarters, Department of Army

IA

International Agreement

IDEF Integrated Definition Language	OMA Operations and Maintenance, Army	SIMTECH Simulation and Technology Program
IEA International Exchange Agreement	OPA Other Procurement, Army	SMDC U.S. Army Space and Missile Defense Command
IEEE Institute of Electrical and Electronic Engineers	OPTEC U.S. Army Operational Test and Evaluation Command	SOW Statement of Work
IPR In-Process Review	OSA Office of Secretary of the Army	SSA Staff Support Agency
IV&V Independent Verification and Validation	P&A Price and Availability	STAMIS Standard Management Information System
JROC Joint Requirements Oversight Council	PAED Army Program Analysis and Evaluation Directorate	STOW Synthetic Theater of War
JTA - Army Joint Technical Architecture - Army	PAO Public Affairs Officer	T&E Test and Evaluation
LOA Letter of Agreement	PDU Protocol Data Unit	TAFIM Technical Architecture Framework for Information Management
MACOM Major Army Command	PEG Program Evaluation Group	TEA Transportation Engineering Agency
MAIS Major Automated Information Systems	PEO Program Executive Officer	TEC Topographic Engineering Center
MAISRC Major Automated Information Systems Review Council	PM Program Manager	TEMO Training Exercises and Military Operations
MAP Mandatory Procedures for Major Defense Acquisition Programs	POC Point of Contact	TPO Technical Project Officer
MDA Milestone Decision Authority	POM Program Objective Memorandum	TRAC TRADOC Analysis Center
MDEP Management Decision Package	PPBES Planning, Programming, Budgeting, and Execution System	TRADOC U.S. Army Training and Doctrine Command
M&S Model(s) and Simulation(s)--Used in singular and plural	PPBS Planning, Programming, and Budgeting System	TRANSCOM U.S. Transportation Command
MOA Memorandum of Agreement	PBD Program Budget Decision	USACAA U.S. Army Concepts Analysis Agency
MSEA M&S Executive Agent	QA Quality Assurance	USACE U.S. Army Corps of Engineers
MSIS Model and Simulation Information System	R&D Research and Development	USAISC U.S. Army Information Systems Command
MSRR Model and Simulation Resource Repository	RDT&E Research, Development, Test and Evaluation	USAREUR U.S. Army Europe
MTMCTEA Military Traffic Management Command Transportation Engineering Agency	RFP Request for Proposal	USARPAC U.S. Army Pacific
NGB National Guard Bureau	RIC Requirements Integration Council	USARSO U.S. Army, South
NIMA National Imagery and Mapping Agency	RIWG Requirements Integration Working Group	USASAC U.S. Army Security Assistance Command
NSTD Non-System Training Device	S&T Science and Technology	USASOC U.S. Army Special Operations Command
OCAR Office of the Chief, Army Reserve	SCC Standards Category Coordinator	VCSA Vice Chief of Staff of the Army
OGC Office of the General Counsel	SES Senior Executive Service	V&V Verification and Validation
		VV&A Verification, Validation, and Accreditation
		VV&C Verification, Validation, and Certification

Section II

Terms

Accreditation.

The official determination that a model, simulation, or federation of M&S is acceptable for use for a specific purpose.

Accreditation Agent.

The organization designated by the application sponsor to conduct an accreditation assessment for a M&S application.

Accreditation Criteria

A set of standards that a particular model, simulation, or federation of M&S must meet to be accredited for a specific purpose.

Advanced Concepts and Requirements (ACR) Domain

One of the three domains for Army M&S applications. ACR includes experiments with new concepts and advanced technologies to develop requirements in doctrine, training, leader development, organizations, materiel and soldiers which will better prepare the Army for future operations. ACR evaluates the impact of horizontal technology integration through simulation and experimentation using real soldiers in real units.

Advanced Distributed Simulation (ADS).

A set of disparate M&S operating in a common synthetic environment within which humans may interact at multiple sites networked using compliant architecture, modeling, protocols, standards, and data bases. The ADS may be composed of three modes of simulation-- live, virtual, and constructive which can be seamlessly integrated.

Analysis

A broad category of study and investigation which includes support to operational, tactical, and strategic decision making.

Analysis of Alternatives

A study conducted to provide support for acquisition decisions in the acquisition cycle. The AoA illuminates the relative advantages and disadvantages of the alternatives being considered showing the sensitivity of each alternative to possible changes in key assumptions (e.g., threat) or variables (e.g., performance capabilities). There shall be a clear linkage between the AoA, system requirements, and system evaluation measures of effectiveness.

Application

A specific, individual project session that requires or uses an M&S to achieve its purpose.

Application Sponsor

The organization that utilizes the results or products from a specific application of a model or simulation.

Architecture

The structure of components in a program/system, their relationships, and the principles and guidelines governing their de-

sign and evolution over time.

Army Enterprise Architecture (AEA) Master Plan

An integrated plan of action for accomplishing Army-wide information technology and investment strategies to accomplish the Joint Vision and the Army Vision 2010. It documents the total AEA and specifies the information systems programs and resource requirements necessary to support stated sessions and objectives.

Army Model and Simulation Standards Report

The Army Model and Simulation Standards Report contains the yearly status of Army efforts to standardize model and simulation techniques and procedures. It also reflects the Army's yearly model and simulations investments throughout the Army Model Improvement Program (AMIP) and the Simulation Technology (SIMTECH) Program.

Automated Information System (AIS)

A combination of information, computer hardware, software, personnel, and telecommunications resources that collects, records, processes, stores, communicates, retrieves, and/or displays information.

Common Use M&S

M&S applications, services, or materials provided by a DoD Component to two or more DoD components.

Computer Generated Forces

A capability/technology where computer generated forces are a doctrinally correct representation of both friendly and opposing forces. These forces will support simulations by providing opposing forces, supporting forces, and forces needed to permit a smaller number of personnel to represent a much larger force.

Configuration management

The application of technical and administrative direction and surveillance to identify and document the functional and physical characteristics of a M&S, control changes, and record and report change processing and implementation status.

Constructive M&S

M&S that involve real people making inputs into a simulation that carries out those inputs by simulated people operating simulated systems.

Data Certification

The determination that data have been verified and validated. Data user certification is the determination by the application sponsor or designated agent that data have been verified and validated as appropriate for the specific M&S usage. Data producer certification is the determination by the data producer that data have been verified and validated against documented standards or criteria.

Data Exchange Standard

Formally defined protocols for the format and content of data messages used for inter-changing data between networked simulation and/or simulator nodes used to create and operate a distributed, time and space coherent synthetic environment. Current standards include ALSP and DIS Protocol Data Units.

Data Proponent

The agency or organization that has primary responsibility for a Data collection or data base. The proponent develops the requirement for the data.

Data Standards

A capability that increases information sharing effectiveness by establishing standardization of data elements, data base construction, accessibility procedures, system communication, data maintenance and control.

Data Validation

The documented assessment of data by subject area experts and its comparison to known values. Data user validation is an assessment as appropriate for use in an intended M&S. Data producer validation is an assessment within stated criteria and assumptions.

Data Verification

Data producer verification is the use of techniques and procedures to ensure that data meets constraints defined by data standards and business rules derived from process and data modeling. Data user verification is the use of techniques and procedures to ensure that data meets user specified constraints defined by data standards and business rules derived from process and data modeling, and that data are transformed and formatted properly.

Data Verification, Validation, and Certification

The process of verifying the internal consistency and correctness of data, validating that it represents real world entities appropriate for its intended purpose or an expected range of purposes, and certifying it as having a specified level of quality or as being appropriate for a specified use, type of use, or range of uses. The process has two perspectives-- producer and user process.

Defense Simulation Internet (DSI)

A wide band telecommunications network operated over commercial lines with connectivity to both military and civilian satellites allowing users to be linked on a world-wide, wide area network.

Distributed Interactive Simulation (DIS)

A subset of advanced distributed simulation which interfaces through the use of DIS Protocol Data Units.

DIS Compatible

Two or more simulations/simulators are DIS compatible if (1) they are DIS compliant and (2) their models and data that send and in-

terpret protocol data units support the realization of a common operational environment among the systems (coherent in time and space).

DIS Compliant

A simulation/simulator is DIS compliant if it can send and receive protocol data units in accordance with IEEE Standard 1278 and 1278 (Working Drafts). A specific statement must be made regarding the qualifications of each protocol data unit.

Dynamic Environment

The environment is constantly changing as a result of man-made efforts (battlefield smoke) and natural phenomenon (weather). Incorporating dynamic environment into real time simulations provides a more realistic test bed for weapons, equipment, and personnel.

Emulator

A physical M&S which duplicates the behavior, properties, or performance of another system. Emulators are frequently used to generate inputs for other M&S.

Fair Fight

Two or more simulations may be considered to be in a fair fight when differences in the simulations' performance characteristics have significantly less effect on the outcome of the conflict than actions taken by the simulation participants.

Federation Element

Term applied to an individual M&S that is part of a federation of models and simulations. Federation elements may be distributed.

Federation of Models and Simulations

A system of interacting M&S with supporting infrastructure, based on a common understanding of the objects portrayed in the system.

Firmware

The combination of a hardware device and computer instructions or computer data that reside as read-only software on the hardware device. The software cannot be readily modified under program control.

General-use M&S Applications

Specific representations of the physical environment or environmental effects used by, or common to, many M&S (e.g., terrain, atmospheric, or hydrographic effects).

High Level Architecture

Major functional elements, interfaces, and design rules, pertaining, as feasible, to all DoD simulation applications, and providing a common framework within which specific system architectures can be defined.

Independent Verification and Validation (IV&V)

The conduct of verification and validation of M&S by individuals or agencies that did not develop the M&S. IV&V does not require complete organizational independence, but does imply a reasonable degree of organiza-

tional separation to assure unbiased analysis.

Interoperability

The ability of a set of M&S to provide services to and accept services from other M&S and to use the services so exchanged to enable them to operate effectively together.

Live Simulation

A representation of military operations using live forces and instrumented weapon systems interacting on training, test, and exercise ranges which simulate experiences during actual operational conditions.

Management threshold

The threshold or limit, as defined by management, when a M&S passes from the management considerations of one category or level to the management considerations of another category.

Model

A model is a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process.

Model Types.

a. *Physical model.* A physical representation of the real world object as it relates to symbolic models in the form of simulators.

b. *Mathematical model.* A series of mathematical equations or relationships that can be discretely solved. This includes M&S using techniques of numerical approximation to solve complex mathematical functions for which specific values cannot be derived (e.g., integrals).

c. *Procedural model.* An expression of dynamic relationships of a situation expressed by mathematical and logical processes. These models are commonly referred to as simulations.

M & S Developer

The organization responsible for developing, managing or overseeing M&S developed by a DoD component, contractor, or Federally Funded Research and Development Center. The developer may be the same agency as the proponent agency.

M&S Proponent

The organization responsible for initiating the development and directing control of the reference version of a model or simulation. The proponent will develop and execute a viable strategy for development and maintenance throughout the life cycle of the M&S; and for directing the investment of available resources in same. The M&S proponent serves as the advocate and final authority on their M&S. The proponent will advise the DUSA(OR) on release of the M&S to foreign countries, and will advise the MACOM or Organizational Release Authority for domestic release. Except where responsibilities are specifically designated to an acquisition official by DoD or DA policy e.g. DoD 5000.2 or AR 70-1, the M&S proponent is responsible

for, but may delegate execution of: M&S Development; Configuration Management; Preparation and Maintenance of Simulation Object Models (SOMs) as appropriate; all aspects of Verification and Validation; and maintenance of current information in all catalogs and repositories.

Modeling and Simulation

The development and use of live, virtual, and constructive models including simulators, stimulators, emulators, and prototypes to investigate, understand, or provide experiential stimulus to either (1) conceptual systems that do not exist or (2) real life systems which cannot accept experimentation or observation because of resource, range, security, or safety limitations. This investigation and understanding in a synthetic environment will support decisions in the domains of research, development, and acquisition (RDA) and advanced concepts and requirements (ACR), or transfer necessary experiential effects in the training, exercises, and military operations (TEMO) domain.

Non-System Training Device (NSTD)

A training device or simulation which is not directly identified with a unique weapons system, but rather has application over a wide spectrum of potential users (e.g., WARSIM). The NSTD process is governed by the AR 70 series.

Open Systems Environment

The fielding of hardware and software products that are interoperable and portable. The objective is to promote competition by allowing systems developed by multiple vendors and nations to interoperate through a common set of computer and communications protocols.

Pre-Processor

A software (and sometimes hardware) unit which conditions or prepares data before the data is input into a model or simulation. Example: A code which converts metric data from cartesian (rectangular) coordinates to flight coordinates (Euler angles) prior to its being input into an aircraft or guided missile model.

Post Processor

A software (and sometime hardware) unit which conditions data after it is output by a model or simulation, in order to adapt it to a human analyst/observer or to another model. Example: A code which converts streams of metric measurement data from a simulation into a graphic representation of a scene as viewed from the perspective of an aircraft or missile.

Proponent

See M&S Proponent or Data Proponent

Protocol Data Unit (PDU) Standards

In accordance with IEEE Standard 1278, formally defined data exchange standards established for each of the several primary

classes of functionality which is represented in the DIS synthetic environment (e. g. movement, weapons, firing effects, collisions, etc.).

Reference version

The most recent version of a M&S which has been released for community use by, and under configuration management of, the M&S users group executive committee.

Research, Development, and Acquisition (RDA) Domain

One of the three domains for Army M&S applications. Includes all M&S used for design, development, and acquisition of weapons systems and equipment. M&S in the RDA domain are used for scientific inquiry to discover or revise facts and theories of phenomena, followed by transformation of these discoveries into physical representations. RDA also includes test and evaluation (T&E) where M&S are used to augment and possibly reduce the scope of real-world T&E.

Simulation

A method for implementing a model(s) over time.

Simulator

- a. A device, computer program, or system that performs simulation.
- b. For training, a device which duplicates the essential features of a task situation and provides for direct practice.
- c. For Distributed Interactive Simulation (DIS), a physical model or simulation of a weapons system, set of weapon systems, or piece of equipment which represents some major aspects of the equipment's operation.

Sponsoring agency

The agency which sponsors the development or use of M&S utilizing either in-house, other government agency, or contract resources.

Standard

A rule, principle, or measurement established by authority, custom, or general consent as a representation or example.

Standards Categories

The elements of the framework for M&S standards development. The Standards framework contains all the things the Army M&S community seeks to represent algorithmically, devolved into Categories which are assigned to the Army agencies best

suited to coordinate development and maintenance of standards in the technical regime represented by that category.

Stimulator

- a. A hardware device that injects or radiates signals into the sensor system(s) of operational equipment to imitate the effects of platforms, munitions, and environment that are not physically present.
- b. A battlefield entity consisting of hardware and/or software modules which injects signals directly into the sensor systems of an actual battlefield entity to simulate other battlefield entities in the virtual battlefield.

Symbolic M&S

M&S which represent a real system using mathematical equations or computer programs. Symbolic M&S are contrasted from other representations such as maps, board games, field exercises, and mockups.

Synthetic Environments (SE)

Internetted simulations that represent activities at a high level of realism from simulations of theaters of war to factories and manufacturing processes. These environments may be created within a single computer or a vast distributed network connected by local and wide area networks and augmented by super-realistic special effects and accurate behavioral models. They allow visualization of and immersion into the environment being simulated. (Ref. DoD 5000.59-P; CJSI 8510.01)

Technical Architecture

A minimal set of rules governing the arrangement, interaction, and interdependence of the parts or elements that together may be used to form an information system, and whose purpose is to insure that a conformant system satisfies a specified set of requirements.

Test and Evaluation (T&E)

Test and evaluation includes engineering, developmental, and operational tests.

Training Effectiveness Analysis (TEA)

A study conducted by TRADOC Analysis Center (TRAC) to determine the adequacy of the operator, maintainer, unit, and institutional training for new equipment which is fielded. TEAs evaluate training environment, training devices, soldier hardware-software interface, and military occupational specialty

selection criteria.

Training, Exercises, and Military Operations (TEMO) Domain

One of the three domains for Army M&S applications. TEMO includes most forms of training at echelons from individual simulation trainers through collective, combined arms, joint, and/or combined exercises. TEMO includes mission rehearsals and evaluations of all phases of war plans. Analysis conducted during the rehearsal or evaluation validates the plan as best as the simulation environment will allow.

Validation

The process of determining the extent to which a M&S is an accurate representation of the real-world from the perspective of the intended use of the M&S. Validation methods include expert consensus, comparison with historical results, comparison with test data, peer review, and independent review.

Validation Agent

The organization designated by the M&S sponsor to perform validation of a model, simulation, or federation of M&S.

Verification

The process of determining that a M&S accurately represents the developer's conceptual description and specifications. Verification evaluates the extent to which the M&S has been developed using sound and established software engineering techniques.

Verification Agent

The organization designated by the M&S sponsor to perform verification of a model, simulation, or federation of M&S.

V&V agent

The organization designated by the M&S sponsor to perform verification and validation of a model, simulation, or federation of M&S.

V&V proponent

The government agency responsible for ensuring V&V is performed on a specific M&S.

Virtual M&S

A synthetic representation of warfighting environments patterned after the simulated organization, operations, and equipment of actual military units.

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